CRITICAL ITEMS LIST SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM SYSTEM: COMMUNICATIONS AND TRACKING ASSEMBLY: SPACE TO SPACE ORBITER RADIO (SSOR) ASS'Y P/N; SEQ16102581 APPROVAL DATE: SUPERCEDES REV: N/A DATE: N/A END ITEM EFFECTIVITY: OV102, OV103, OV104, OV105, AND SUBS. SHEET LOF 4 PREPARED BY: Nanci A. Olson DATE: 12/17/96 APPROVAL: SR&MA: DATE: DESIGN: Jork Chausa DATE:: <u>5~7 ~03</u> SSCS PROJECT MANAGER: DATE: Wlati Le-Ka INTACT ABORT MODE CRIT: N/A CRITICALITY(H/F): 2/2 REDUNDANCY SCREENS: A-N/A B-N/A C-N/A FMEA REFERENCE: SSOR-08 NAME: SSOR DRAWING REFERENCE: SED16102581, SID16102642, SID16102612 OUANTITY: 1 CIL# FAILURE MODE FAILURE EFFECT RATIONALE FOR ACCEPTABILITY REV FUNCTION AND CAUSE SSOR-08 BASIC SUBSYSTEM: (1) Provides RF FAILURE MODE: DESIGN: The electrical design of the SSOR duplex voice Audio input Loss of Transmit is based upon JSC in-house engineering model hardware. Litton is manufacturing open/short comm between Voice Orbiter and Communications to the hardware in accordance with the EMU's. Station and EMUs. CAUSE: appropriate NHB 5300.4 standards. Contamination. No effect on (2) Receives vibration, shock, biomed and Passive EEE parts are selected from the biomed and EEE parts failure, telemetry from guidelines of MIL-STD-975. Active EEE telemetry from or temperature EMUs or on are approved by the fSC Engineering Directorate Certified Parts Approval EMU cycle command and telemetry to/from Process. (3) Provides RF Station duplex voice The high, low, and shield audio input are oncomm between INTERFACING separate pins in a NB7H16-PW connector. MISSION Orbiter and PHASES: SUBSYSTEMS: M22759 wire is run from the String I and Station None: String 2 signal processors to the NB7H16-Prc EVA PW connector. Splices are made in (4) Provides RF MISSION: accordance with Rockwell specification command to ME416-0031-1004. Audio circuits on the EVA. Terminate EVA. Space Station No effect on Station String 1 and String 2 signal processors are and telemetry Post EVA rendezvous isolated by solid state relays. Cables are from Space laced to avoid strain. Station Station CREW/VEHICLE: Rendezvous TEST: No effect. SUCCESS PATHS CERTIFICATION: One time test on Qual REMAINING SSOR. Audio verified before, during, and AFTER FIRST after exposure to environments. FAILURE: 0 QUALIFICATION THERMAL TEST - 7 TIME TO EFFECT: cycles from 25F to 135F operating and 1 cycle to -65F non-operating. Audio verified minutes before, during, and after thermal test.

CRITICAL ITEMS LIST SYSTEM: COMMUNICATIONS AND TRACKING SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM ASSEMBLY: SPACE TO SPACE ORBITER RADIO (SSOR) ASSIY P/N: SED16102581 APPROVAL DATE: SUPERCEDES REV: N/A DATE: N/A END ITEM EFFECTIVITY: OV102, OV103, OV104, OV105, AND SUBS. SHEET 2 OF 4 PREPARED BY: Nanci A. Olson DATE: 12/17/96 APPROVAL: SR&MA: DATE: DESIGN: DATE: SSCS PROJECT MANAGER: DATE: CRITICALITY(H/F): 2/2 INTACT ABORT MODE CRIT: N/A REDUNDANCY SCREENS: A-N/A B-N/A C-N/A FMEA REFERENCE: SSOR-08 NAME: SSOR DRAWING REFERENCE, SED16102581, SID16102642, SID16102612 QUANTITY: 1 CIL# REV FUNCTION FAILURE MODE FAILURE EFFECT RATIONALE FOR ACCEPTABILITY AND CAUSE SSOR-08 BASIC (1) Provides RF FAILURE MODE: SUBSYSTEM: TEST: (CONTINUED) duplex voice Audio input Loss of Transmit comm between open/short Voice PRESSURE TEST - 8 to 15.23 psia at Orbiter and Communications to 2psi/minute repress/depress rate. Non-EMIC's. CAUSE: Station and EMUs. operating excursion to 30 psia. Audio Contamination. No effect on verified before, during and after pressure (2) Receives vibration, shock biomed and test. biomed and EEE parts failure. telementy from telemeny from or temperature EMUs or on SHOCK - Bench handling 4 inch drop test EMIC cycle command and on each corner. telemetry to/from Landing shock and acceleration (3) Provides RF Station environments certified by analysis. duplex voice committeeveen MESSION INTERFACING VIBRATION -Orbiter and PHASES: SUBSYSTEMS: Test-induced (QAVT) - 5 minutes per axis. Station None 20 to 80 Hz - increasing 3 dB/oct Pre EVA 80 to 350 Hz - constant 0.067 g²/Hz (4) Provides RF MISSION: 350 to 2000 Hz - decreasing 3 dB oct command to EVA. Terminate EVA Flight-induced - 16 min, 40 sec per axis Space Station No offert on Station 20 to 150 Hz - increasing 6 dB/oct and telemetry Post EVA rendezvous 150 to 1000 Hz - constant 0.03 g²/Hz from Space 1000 to 2000 Hz - decreasing 6 dB/oct Station Station CREW/VEHICLE: Audio ventred before and after each Rendezvous No effect. vibration test SUCCESS PATHS: REMAINING Salt-fog, humidity, and fungus certified by AFTER FIRST analysis to requirements of ISC 26799 FAILURE: 0 (SSOR Specification) TIME TO EFFECT: ACCEPTANCE: minutes TEMPERATURE - One and one-half cycles from 30F to 130F, with audio verified at temperature extremes.*

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ASSEMBI	COMMC LY: SPAC	JNICATIONS AND UE TO SPACE ORB	TRACKING \$1 TIER RADIO (SSOR	UBSYSTEM: SPACE) ASS'Y P/N: SED			
					APPROVAL DATE		
END IT	EM EFFI	CTIVITY: OV102	. OV103, OV104, OV	Ins and sure	SUPERCEDES REV: N/A DATE, N/A		
PREPARE	DBY: N	anci A. Olson	1)4	ATE: 12/17/96	SHEET 3 OF 4		
APPROVA				112. 12.77.770			
SR&MA:					DATE:		
DESIGN:							
SSCS PRO					DATE:		
CRITICAL	JTY(H/F)): 2 /2	IN	TACT ABORT MODE	CRIT: N/A		
REDUND.	ANCY SO	REENS: A-N/A B	-N/A C-N/A				
		E: SSOR-08					
NAME: S					· · · · · · · · · · · · · · · · · · ·		
DKAWING	J KEF <u>ERI</u>	ENCE: SED161025	81, SID16102642, SII	D16102612	•		
QUANTIT CIL#			· · · · · · · · · · · · · · · · · · ·				
	REV	FUNCTION	FAILURE MODE AND CAUSE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY		
SSOR-08	BASIC	1-7 2101200740	FAILURE MODE:	SUBSYSTEM:	TEST: (CONTINUED)		
		duplex voice	Audio input	Loss of Transmit	!		
]	comm between Orbiter and	open/short	Voice	VIBRATION - 30 sec. per axis minimum		
		EMU's.	CALIER	Communications to	20 to 80 Hz - increasing 3 dB/oct		
		EAIO 9.	CAUSE: Contamination,	Station and EMUs.	80 to 350 Hz - constant 0.04 g ² /Hz		
		(2) Receives	vibration, shock,	No effect on biomed and	350 to 2000 Hz -decreasing 3 dB/oct		
		biomed and	EEE parts failure,	telemetry from	Audio verified before and after each axis.		
		telemetry from	or temperature	EMUs or on	PREINSTALLATION ACCEPTANCE		
		EMU	cycle	command and	TEST - Performed periodically at JSC prior		
			_	telemetry to/from	to delivery of SSOR for Orbiter installation.		
		(3) Provides RF		Station	Includes complete electrical performance		
		duplex voice			with Audio output measured. Unit operated		
		comm between	MISSION	INTERFACING	approximately 40 hours during acceptance		
	•	Orbiter and	PHASES:	SUBSYSTEMS:	testing.		
		Station	Dec T1/4	None			
		(4) Provides RF	Pre EVA	MICHION	GROUND INTERVAL (OMDP) TEST.		
		command to	EVA	MISSION: Terminate EVA.	Interval (OMDP) checkout testing is		
	1	Space Station	214	No effect on Station	accomplished in accordance with the		
		and telemetry	Post EVA	fendezvons	OMRSD (V74). Tests in the OPF verify audio. On the pad, functional verification of		
٠		from Space		TCLULIVOUS	audio in V1103 (EMI) checkout).		
.		Station	Station	CREW/VEHICLE:			
			Rendezvous	No effect.			
					ENSPECTION: The SSOR is manufactured		
]	į			SUCCESS PATHS	in accordance with an approved Quality		
ļ		ļ		REMAINING	Assurance Plan. Subassemblies are		
		ĺ		AFTER FIRST	inspected for conformance with released		
	:			FAILURE: 0	drawings and standards for parts placement,		
				TIN (E tro DE Brown	soldering, and cleanliness.		
	i			TIME TO EFFECT:			
—· — '		!	···	minutes			

					300 27723A					
CRITICAL ITEMS LIST										
SYSTEM: COMMUNICATIONS AND TRACKING SUBSYSTEM: SPACE TO SPACE COMMUNICATIONS SYSTEM										
ASSEMBLY: SPACE TO SPACE ORBITER RADIO (SSOR) ASS'Y P/N: SED16102581										
				,	APPROVAL DATE:					
					SUPERCEDES REV: N/A DATE: N/A					
END IT	EM EFFE	CTIVITY: OV 102	OV103, OV104, OV1	105 AND SUBS.	SHEET 4 OF 4					
PREPARED BY: Nanci A. Olson DATE: 12/17/96										
APPROVAL:										
SR&MA:	SR&MA: DATE:									
DESIGN:			DATE:							
SSCS PRO	JECT MA	NAGER:			DATE:					
CRITICAL			IN	ACT ABORT MODE						
REDUNDA	ANCY SC	REENS: A-N/A B	-N/A C-N/A							
		E: SSOR-08								
NAME: \$	SOR				· · · · · · · · · · · · · · · · · · ·					
DRAWING	G REFERI	ENCE: SED161025	81, SID16102642, SII	216102612						
DRAWING REFERENCE: SED16102581, SID16102642, SID16102612 QUANTITY: 1										
CIL#	REV	FUNCTION	FAILURE MODE	FAILURE EFFECT	RATIONALE FOR ACCEPTABILITY					
			AND CAUSE		ANTIONALISTOR ACCEPTABILITY					
SSOR-08	BASIC	(1) Provides RF	FAILURE MODE:	SUBSYSTEM:	FAILURE HISTORY: Current data can be					
ļ	•	duplex voice	Audio input	Loss of Transmit	found in PRACA database.					
		comm between	open/short	Voice	Tourie III I RACA GALAGASE,					
		Orbiter and		Communications to						
		EMU's.	CAUSE:	Station and EMUs.	OPERATIONAL USE: Crew is trained to					
			Contamination,	No effect on	terminate EVA upon loss of all					
		(2) Receives	vibration, shock,	biomed and	communications with the Orbiter.					
		biomed and	EEE parts failure,	telemetry from	The state of the s					
		telemetry from	or temperature	EMUs or on						
		EMU	cycle	command and						
				telemetry to/from						
		(3) Provides RF		Station						
		duplex voice			·					
	'	comm between	MISSION	INTERFACING						
i		Orbiter and	PHASES:	SUBSYSTEMS;						
-		Station		None	ļ ļ					
			Pre EVA		i 'i					
		(4) Provides RF		MISSION:						
		command to	EVA	Terminate EVA						
ı		Space Station		No effect on Station						
ļ		and telemetry	Post EVA	rendezvous						
.		from Space	i							
· I		Station	Station	CREW/VEHICLE:	ì					
			Rendezvous	No effect.						
.					Į.					
.				SUCCESS PATHS						
1				REMAINING						
ĺ	·			AFTER FIRST						
	1		ļ	FAILURE: 0						
				770 F TA						
		{		TIME TO EFFECT:	1					
<u>.</u>			<u>.</u>	minutes						